

# PATENT ABSTRACTS OF JAPAN

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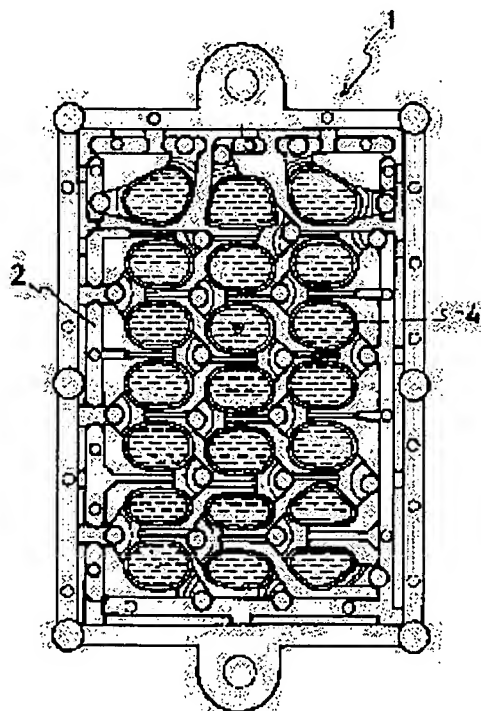
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(54) METHOD FOR PROCESSING CHARACTER, NUMERAL, MARK, PATTERN OR THE LIKE ON TRANSPARENT MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To shorten processing time and to prevent the occurrence of a defective product due to color irregularity, foreign matter, waste thread by evaporating/scattering a metal foil on the surface of a transparent material by a hot stamp method, drawing character, numeral, mark, pattern, etc., and forming a protective film on the surface.

SOLUTION: An opalescent coating film 2 is formed on the surface of a button group of a portable telephone set made of a transparent resin, then green and red coloring coating films are formed on prescribed two places in order to easily identify the picture at the states receiver is placed and taken up. Succesively, a silver color Al foil 4 is thermally stuck onto the surface of the button group 1 by a stamp method. The Al foil 4 consists of an adhesion layer, an Al layer and a top coat for oxidation prevention. Next by marker trimming irradiating with a YAG laser machine, the Al foil 4 of the place corresponding to a character, number, mark, picture is evaporated/scattered, thus, drawing is done. Finally, a transparent protective coating film is formed by coating/drying an ultraviolet curing paint.



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3. In the drawings, any words are not translated.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention provides a face plate a structural face plate the small letter of common components the small letter of a keytop \*\* \*\* of a cellular phone, a clock dial, and weak-electric-current components-related, and at large, the \*\* whole of the components for automobiles; and at large, the face plate of office supplies and a decoration plate, common furniture, and at large, medical supplies and the accessories for days, all other \*\*, and at large with the high processing approach of precision, such as a fine alphabetic character, a figure, a notation, and a pattern.

[0002]

[Description of the Prior Art] The processing approach for describing the fine alphabetic character to \*\*, a dial, and a face plate etc. conventionally had correspondence by the marker trimming by the YAG laser processing machine in the silk printing method of construction and the vacuum metal vacuum evaporationno article. Correspondence with a vacuum metal vacuum evaporationno article is the technique indicated by patent No. (JP,3-23915,B) 1659362. This gives a base coat (interior paint film by the organic coating) to a transparence material. After making it dry, carry out vacuum deposition of the metals, such as aluminum, and transparent topcoat (sheathing paint film) for protecting on the metal layer subsequently vapor-deposited is given. When evaporation removal of a metal layer and the topcoat is carried out, an alphabetic character, a figure, a notation, a pattern, etc. are described and topcoat is not removed by irradiating an YAG laser, it is made to remove using broad adhesive tape if needed. A base coat is for forming the light transmission coloring layer of coloring in order to improve the adhesion student in the case of making a metal vapor-deposit.

[0003]

[Problem(s) to be Solved by the Invention] It was difficult to express a fine alphabetic character etc. by the silk printing method of construction for a blot of the ink which is the proper defect of silk printing. Then, although the means by the vacuum metal vacuum evaporationno article was proposed, it took 120 minutes with the drying temperature of 80 degrees C to dry a base coat from 60 minutes, and the vacuum evaporationno process of aluminum itself had become this thing to it about 40 minutes from 20 minutes. Furthermore, as a trouble by vacuum evaporationno of aluminum, color nonuniformity tended to occur for paint, when the percent defective by the foreign matter or waste thread was high and a foreign matter and waste thread adhered, the whole became a defective and the product yield was getting worse. By the time vacuum evaporationno was finished, it was total and had become this thing for 2 hours.

[0004] In vacuum metal vacuum evaporationno of aluminum etc., it will be necessary to stick and cover a masking tape in the part where a coating must not reach during paint but, and this masking cost was to increase very much. Furthermore, in vacuum metal vacuum evaporationno of aluminum etc., the thickness of topcoat is thick, and since it is transparent, since a laser beam is only penetrated, it is becoming the defective which the glow remnants of topcoat will adhere to a front face, and does not wipe off with a certain means. Therefore, the process was to increase although removal by adhesive tape is proposed. In order to avoid this, when laser processing was performed without applying topcoat,

people touch a hand, aluminum oxidized and the fat of a finger was to adhere or to become black with the acid and humidity in air.

[0005]

[Means for Solving the Problem] This invention is developed that the technical problem of such a conventional technique should be solved. The processing approach concerning invention of claim 1 is characterized by making the front face of plastics, glass, and other transparence materials carry out thermocompression bonding of the metallic foil with a hot-stamping method of construction, making it carry out evaporation scattering of the metallic foil with laser marker trimming, describing an alphabetic character, a figure, a notation, a pattern, etc. on it, and forming a protective coat in it on a front face. invention of claim 2 -- the processing approach according to claim 1 -- setting -- the ground of a transparence material -- translucency opalescence paint -- and -- or after carrying out translucency coloring paint, it is characterized by making it move to a hot-stamping method of construction. The processing approach concerning invention of claim 3 is characterized by making the rear face of plastics, glass, and other transparence materials carry out thermocompression bonding of the metallic foil with a hot-stamping method of construction, carrying out evaporation scattering of the metallic foil with laser marker trimming, and describing an alphabetic character, a figure, a notation, a pattern, etc. Invention of claim 4 is characterized by having carried out coloring paint and giving color by the coloring paint film after laser marker trimming, at an alphabetic character etc. in the processing approach according to claim 3.

[0006]

[Embodiment of the Invention] Drawing 1 thru/or drawing 5 apply the processing approach of of the alphabetic character and pattern to the transparence material concerning this invention to \*\* used as the ten key and function key of the cellular phone with which the miniaturization progressed quickly in recent years. Drawing 1 is \*\*\*\* 1 of the cellular phone which consists of transparence resin fabricated to one with acrylic resin, polycarbonate resin, ABS plastics, etc., opalescence paint is performed to this front face, the opalescence paint film 2 is formed, and in order to identify easily drawing in the condition of having separated with the condition that the earphone placed in this case at two necessary places, on the opalescence paint film 2, performs coloring paint to green and red, and forms the coloring paint film 3 ( drawing 2 and drawing 5 a). Next, the front face of \*\*\*\* 1 is made to carry out thermocompression bonding of the silver aluminium foil 4 with a hot-stamping method of construction ( drawing 3 and drawing 5 b). Aluminium foil 4 consists of a glue line 41, an aluminum layer 42, and topcoat 43 for antioxidizing, and makes a glue line 41 adhere to \*\*\*\* 1. Next, it describes by carrying out evaporation scattering of the aluminium foil 4 of the part which corresponds to an alphabetic character, a figure, a notation, and a pattern with the marker trimming irradiated with an YAG laser processing machine ( drawing 4 and drawing 5 c). Finally, apply paint for ultraviolet curing, it is made to dry, and \*\*\*\*\* ( drawing 4 and drawing 5 d) of the transparent protection paint film 5 is formed and carried out.

[0007] Drawing 6 expresses what was processed on the rear face of \*\*\*\* 1 of a cellular phone as shown in drawing 1 . The rear face of \*\*\*\* 1 is made to carry out thermocompression bonding of the aluminium foil 4 with a hot-stamping method of construction ( drawing 6 a). \*\* which is made to carry out evaporation scattering of the part which corresponds to an alphabetic character, a figure, a notation, a pattern, etc. with the marker trimming by the YAG laser processing machine, describes ( drawing 6 b), carries out coloring paint after that, forms the coloring paint film 3, and gives color to \*\*\*\*\* ( drawing 6 c) etc. -- make it like and let this coloring paint film 3 be a protection paint film.

[0008] Although the hard resin mold goods of acrylic resin or polycarbonate resin were mentioned as a transparence material, since it is sufficient if it is a transparence material, it may be made from a transparence sheet plastic or glass. Although what adopted the silver by aluminium foil 4 as a ground color as a metallic foil by the hot-stamping method of construction was shown, if it becomes a metallic foil, it is not limited to ALUMINUM but various colors and color tones, such as gold, those with gloss, grinding, etc. can be adopted according to an application. A hot-stamping method of construction shall be combined with a rubber method, a stamp method, a mechanical control by roller, other materials, a configuration, and the contents of an expression, and shall be chosen suitably. in addition -- since it is a

hot-stamping method of construction, although it adheres up to the R side of a material -- a lateral portion -- until -- it cannot be made to adhere

[0009] Although parts, such as an alphabetic character and a graphic form, were explained as what carries out evaporation scattering as processing to the aluminium foil 4 as a metallic foil by the YAG laser processing machine, it leaves an alphabetic character and a graphic form part, and evaporation scattering of the perimeter can be carried out, or it can leave the profile of an alphabetic character graphic form part, and a suitable processing means can be adopted [ \*\*\*\* / carrying out evaporation scattering of the others ]. When saying in written form by having adopted the marker trimming by the YAG laser processing machine, width of face and height became possible to 0.2mm. The protection paint film 5 can apply not only paint for ultraviolet curing but acrylic lacquer and a 2 liquid urethane coating, or can also constitute them with the means of silk printing or putt printing. After applying; in a dry warehouse, it sets for 30 minutes, in the case of acrylic lacquer and a 2 liquid urethane coating, can be burned from 10 minutes, at 60 degrees C, and it is dried. However, in the case of paint for ultraviolet curing, since it hits against ultraviolet rays and can dry in dozens of seconds, it is efficient.

[0010]

[Effect of the Invention] since masking was not early needed to the extent that floor to floor time was not compared in about 20 seconds per sheet, since the hot-stamping method of construction was adopted instead of vacuum evaporation as compared with the advanced technology which pictures an alphabetic character etc. with an YAG laser processing machine after carrying out vacuum deposition of the metal for this invention to the transparence material, cost was able to be boiled markedly and was able to be reduced. And since there is no generating of an irregular color and the defective by the foreign matter and waste thread like metal vacuum evaporation, the time and effort and time amount concerning inspection decrease. The situation of the thickness of the ARUNIUMU vacuum evaporation to a transparence material and adhesion by the hot-stamping method of construction of aluminum is shown in drawing 7 . Since the paint film of topcoat was thick in vacuum evaporation, when vacuum evaporation and a stamp have 3 layer structures as shown here, but marker trimming was given as mentioned above, taking the paint film of topcoat could not be finished and it was to remain unburnt, but it is the thermocompression bonding by the hot-stamping method of construction by the approach concerning this invention, and since the top will also be burned together and will disappear if marker trimming is given with an YAG laser processing machine, since surface topcoat is thin, such a fault is not produced.

← vacuum  
dep

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[Translation done.]